**Présentation**

Le système étudié est un magasin tampon automatique dont les caisses peuvent être stockées ou déstockées.

**Schéma architectural**



* Le magasin comporte 8 emplacements sur chacun des 9 étages.
* Les emplacements et les caisses associées sont codés de 0 à 71.
* La position de référence des axes en bas et à droite de la caisse 0.
* Le poste de déchargement correspond au code caisse 18.

**Plan de positionnement des caisses**

* La distance entre 2 étages est de 220mm et la distance entre 2 caisses sur le même étage est de 260mm. Il y a un espace de 110mm entre le bâti bas et le bâti haut.
* Les codeurs absolus permettant de connaitre la position de l’axe vertical et la position de l’axe horizontal ont une résolution de 2 mm/point.



 (Colonne 1 ;

Etage 9)

 (Colonne 8 ;

Etage 1)

Position de référence

(Colonne 1 ;

Etage 1)

260mm

220mm

110mm

**Affectation des variables : (Entier)**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Adresse** | **Commentaire** |
| Code\_caisse | %MW0 | Code de la caisse |
| Num\_etage | %MW1 | Numéro de l’étage de rangement de la caisse |
| Num\_Colonne | %MW2 | Numéro de colonne de rangement de la caisse sur l’étagère |
| Pav | %MW3 | Position à atteindre par l’axe vertical |
| Pah | %MW4 | Position à atteindre par l’axe horizontal |

**Travail à effectuer :**

* Calculer les 8 valeurs numériques Pah des positions à atteindre par l’axe horizontal, valeurs délivrées par le codeur de l’axe horizontal pour chacune des 8 colonnes (de 1 à 8) sur un même étage.
* Déterminer l’expression de Pah en fonction du numéro de la colonne.
* Calculer les 9 valeurs numériques Pav des positions à atteindre par l’axe vertical, valeurs délivrées par le codeur de l’axe vertical pour chacun des 9 étages (de 1 à 9).
* Déterminer l’expression de Pav en fonction du numéro de l’étage.
* Les mots constants %KW0 à %KW71 permettent de stocker les valeurs du numéro de l’étage en fonction du code caisse. (Exemples : %KW3 correspond à la caisse 3 donc premier étage et %KW3 = 1 ; %KW68 correspond à la caisse 68 donc neuvième étage et %KW68 = 9).

Les mots constants %KW100 à %KW171 permettent de stocker les valeurs de la colonne en fonction du code caisse. (Exemples : %KW100 correspond à la caisse 0 donc première position et %KW100 = 1 ; %KW171 correspond à la caisse 71 donc huitième position et %KW171 = 8)

Compléter le tableau du document réponse, en donnant les différentes valeurs des mots constants.

* La programmation sera réalisée sous Unity-pro, établir le programme en langage à contact permettant, si le code de la caisse est correct (compris entre 0 et 71), d’affecter, en fonction du code de la caisse :
	+ la valeur du numéro de l’étage Num\_etage
	+ la valeur du numéro de la position à l’étage Num\_colonne.
	+ la valeur numérique de la position à atteindre Pah
	+ la valeur numérique de la position à atteindre Pav.
* Sous unity Pro, créer un projet avec processeur M340 BMX P34 1000 et affecter les variables.
* Affecter les valeurs aux mots constants
* Implanter le programme de gestion des déplacements en fonction du code de la caisse.
* Créer une table d’animation et, pour différents code caisse, vérifier le fonctionnement de votre programme.

**Document réponse**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  **Code caisse**

|  |  |  |
| --- | --- | --- |
| **Code caisse** | **Mots constants** | **Valeurs** |
| 36 | %KW36 |  |
| 37 | %KW37 |  |
| 38 | %KW38 |  |
| 39 | %KW39 |  |
| 40 | %KW40 |  |
| 41 | %KW41 |  |
| 42 | %KW42 |  |
| 43 | %KW43 |  |
| 44 | %KW44 |  |
| 45 | %KW45 |  |
| 46 | %KW46 |  |
| 47 | %KW47 |  |
| 48 | %KW48 |  |
| 49 | %KW49 |  |
| 50 | %KW50 |  |
| 51 | %KW51 |  |
| 52 | %KW52 |  |
| 53 | %KW53 |  |
| 54 | %KW54 |  |
| 55 | %KW55 |  |
| 56 | %KW56 |  |
| 57 | %KW57 |  |
| 58 | %KW58 |  |
| 59 | %KW59 |  |
| 60 | %KW60 |  |
| 61 | %KW61 |  |
| 62 | %KW62 |  |
| 63 | %KW63 |  |
| 64 | %KW64 |  |
| 65 | %KW65 |  |
| 66 | %KW66 |  |
| 67 | %KW67 |  |
| 68 | %KW68 |  |
| 69 | %KW69 |  |
| 70 | %KW70 |  |
| 71 | %KW71 |  |

|  |  |  |
| --- | --- | --- |
| **Code caisse** | **Mots constants** | **Valeurs** |
| 36 | %KW136 |  |
| 37 | %KW137 |  |
| 38 | %KW138 |  |
| 39 | %KW139 |  |
| 40 | %KW140 |  |
| 41 | %KW141 |  |
| 42 | %KW142 |  |
| 43 | %KW143 |  |
| 44 | %KW144 |  |
| 45 | %KW145 |  |
| 46 | %KW146 |  |
| 47 | %KW147 |  |
| 48 | %KW148 |  |
| 49 | %KW149 |  |
| 50 | %KW150 |  |
| 51 | %KW151 |  |
| 52 | %KW152 |  |
| 53 | %KW153 |  |
| 54 | %KW154 |  |
| 55 | %KW155 |  |
| 56 | %KW156 |  |
| 57 | %KW157 |  |
| 58 | %KW158 |  |
| 59 | %KW159 |  |
| 60 | %KW160 |  |
| 61 | %KW161 |  |
| 62 | %KW162 |  |
| 63 | %KW163 |  |
| 64 | %KW164 |  |
| 65 | %KW165 |  |
| 66 | %KW166 |  |
| 67 | %KW167 |  |
| 68 | %KW168 |  |
| 69 | %KW169 |  |
| 70 | %KW170 |  |
| 71 | %KW171 |  |

|  |  |  |
| --- | --- | --- |
| **Code caisse** | **Mots constants** | **Valeurs** |
| 0 | %KW100 |  |
| 1 | %KW101 |  |
| 2 | %KW102 |  |
| 3 | %KW103 |  |
| 4 | %KW104 |  |
| 5 | %KW105 |  |
| 6 | %KW106 |  |
| 7 | %KW107 |  |
| 8 | %KW108 |  |
| 9 | %KW109 |  |
| 10 | %KW110 |  |
| 11 | %KW111 |  |
| 12 | %KW112 |  |
| 13 | %KW113 |  |
| 14 | %KW114 |  |
| 15 | %KW115 |  |
| 16 | %KW116 |  |
| 17 | %KW117 |  |
| 18 | %KW118 |  |
| 19 | %KW119 |  |
| 20 | %KW120 |  |
| 21 | %KW121 |  |
| 22 | %KW122 |  |
| 23 | %KW123 |  |
| 24 | %KW124 |  |
| 25 | %KW125 |  |
| 26 | %KW126 |  |
| 27 | %KW127 |  |
| 28 | %KW128 |  |
| 29 | %KW129 |  |
| 30 | %KW130 |  |
| 31 | %KW131 |  |
| 32 | %KW132 |  |
| 33 | %KW133 |  |
| 34 | %KW134 |  |
| 35 | %KW135 |  |

 | **Mots constants** | **Valeurs** |
| 0 | %KW0 |  |
| 1 | %KW1 |  |
| 2 | %KW2 |  |
| 3 | %KW3 |  |
| 4 | %KW4 |  |
| 5 | %KW5 |  |
| 6 | %KW6 |  |
| 7 | %KW7 |  |
| 8 | %KW8 |  |
| 9 | %KW9 |  |
| 10 | %KW10 |  |
| 11 | %KW11 |  |
| 12 | %KW12 |  |
| 13 | %KW13 |  |
| 14 | %KW14 |  |
| 15 | %KW15 |  |
| 16 | %KW16 |  |
| 17 | %KW17 |  |
| 18 | %KW18 |  |
| 19 | %KW19 |  |
| 20 | %KW20 |  |
| 21 | %KW21 |  |
| 22 | %KW22 |  |
| 23 | %KW23 |  |
| 24 | %KW24 |  |
| 25 | %KW25 |  |
| 26 | %KW26 |  |
| 27 | %KW27 |  |
| 28 | %KW28 |  |
| 29 | %KW29 |  |
| 30 | %KW30 |  |
| 31 | %KW31 |  |
| 32 | %KW32 |  |
| 33 | %KW33 |  |
| 34 | %KW34 |  |
| 35 | %KW35 |  |